



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

**Bradley J. Aitchison, Jarmo Maula, Hannu
Leskinen, Teemu Lang, Pekka Kuosmanen,
Kari Härkönen and Martti Sonninen**

Confirmation No. 5483

Application No. 10/660,365

Filed: September 10, 2003

For: **PRECURSOR MATERIAL
DELIVERY SYSTEM FOR ATOMIC
LAYER DEPOSITION**

Group Art Unit: 1723

Date: February 3, 2004

INFORMATION DISCLOSURE STATEMENT

TO THE COMMISSIONER FOR PATENTS:

1. Pursuant to the duty of disclosure, documents listed on the accompanying Form PTO-1449 (or equivalent) are presented for the Examiner's consideration.
 - ☐ Copies of listed documents are enclosed. (37 CFR § 1.98(a))
 - ☒ Copies of listed U.S. patent documents are omitted because this application was filed after June 30, 2003 and is, thus, subject to image file wrapper processing. Copies of listed foreign patent documents and non-patent literature are enclosed.
 - ☐ Copies of the documents listed on sheet(s) _____ of Form SB/08 are omitted because (1) they are already of record in U.S. Patent Application No. _____, filed _____, on which this application relies for an earlier filing date under 35 U.S.C. § 120; and (2) any information disclosure statement filed in the prosecution of Application No. _____, complies with 37 CFR §§ 1.98(a) through (c). (37 C.F.R. § 1.98(d))
2. ☒ The Examiner's attention is directed to the enclosed copy of copending U.S. Patent Application No. 10/400,054, filed March 25, 2003, for HIGH CONDUCTIVITY PARTICLE FILTER, which is cited in this application.
3. This information disclosure statement is being submitted (check box a., b., or c.):
 - a. ☒ Within three months of the filing date of a national application or entry of the national stage in an international application; or before the mailing of a first Office action on the merits; or before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. (No statement under 37 CFR 1.97(e) is required.); or

- b. ☐ After the period set forth in paragraph 3a, but before the mailing date of either a final action, a notice of allowance, or an action that otherwise closes prosecution in the application. (Check box i. or ii.)
- i. ☐ A \$180.00 information disclosure statement submission fee set forth in 37 CFR 1.17(p) is enclosed, or
- ii. ☐ A statement specified by 37 CFR 1.97(e) is set forth below; or
- c. ☐ After the mailing date of a final action or notice of allowance and on or before payment of the issue fee. A statement specified by 37 CFR 1.97(e) is set forth below. Enclosed is a \$180.00 information disclosure statement processing fee set forth in 37 CFR 1.17(p).
4. If a statement specified by 37 CFR 1.97(e) is required, the attorney or agent signing below hereby states that:
- ☐ each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement; or
- ☐ no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement.
5. ☒ A concise explanation of the relevance of each document not in the English language and/or selected documents in the English language is set forth below.

Citation No. 35 shows a precursor delivery system used in secret between 1986 and 1993 for delivering AlCl_3 precursor vapors in atomic layer deposition systems to produce electroluminescent (EL) displays. Applicant believes this information has not been published or publicly disclosed. However, EL displays made with such precursor delivery systems were sold by the Finlux division of Lohja Corporation in Finland more than a year before the filing date of this application. Planar Systems, Inc., the assignee of the present application, acquired the Finlux division of Lohja Corporation in 1991.

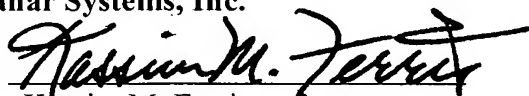
With reference to the drawings of citation No. 35, the precursor delivery system includes a replaceable precursor magazine (31) for holding AlCl_3 powder. The precursor magazine (31) is inserted in a receiving chamber of the system that is sealed by a lid (20) that can be opened to replace the precursor magazine (31). A coarse particle filter (29) and a fine particle filter (28) are mounted in series over an opening of the precursor magazine (31). The body of the precursor delivery system is heated and a vacuum applied to thereby vaporize the AlCl_3 precursor within the precursor magazine (31).

A pulse valve (12) is operable to open a passage extending between the precursor magazine (31) and the reaction chamber (not shown) and to thereby control the flow of AlCl_3 precursor vapors from the magazine (31) into the reaction chamber.

Respectfully submitted,

Planar Systems, Inc.

By



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Attorney Docket No. 11429/12:2



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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

Complete if Known

(Use as many sheets as necessary)

Sheet	1	of	3
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Application Number	10/660,365
Filing Date	September 10, 2003
First Named Inventor	Bradley J. Aitchison
Art Unit	
Examiner Name	
Attorney Docket Number	11429/12:2

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	1	US- 3,446,936	05/27/1969	Hanson et al.	
	2	US- 3,466,424	09/09/1969	Adams	
	3	US- 3,808,035	04/30/1974	Stelter	
	4	US- 3,900,597	08/19/1975	Chruma et al.	
	5	US- 4,002,880	01/11/1977	Davey et al.	
	6	US- 4,058,430	11/15/1977	Suntola et al.	
	7	US- 4,389,973	06/28/1983	Suntola et al.	
	8	US- 4,413,022	11/01/1983	Suntola et al.	
	9	US- 4,735,633	04/05/1988	Chiu	
	10	US- 4,971,100	11/20/1990	Ohmi	
	11	US- 5,166,092	11/24/1992	Mochizuki et al.	
	12	US- 5,362,328	11/08/1994	Gardiner et al.	
	13	US- 5,399,379	03/21/1995	Sandhu	
	14	US- 5,417,236	05/23/1995	Moore et al.	
	15	US- 5,438,952	08/08/1995	Otsuka	
	16	US- 5,451,258	09/19/1995	Hillman et al.	
	17	US- 5,455,014	10/03/1995	Costantino et al.	
	18	US- 5,547,708	08/20/1996	Asaba et al.	

[illegible]Date
Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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U. S. PATENT DOCUMENTS

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		Number-Kind Code ² (if known)			
	19	US- 5,554,226	09/10/1996	Okase et al.	
	20	US- 5,601,107	02/11/1997	Moore et al.	
	21	US- 5,620,524	04/15/1997	Fan et al.	
	22	US- 5,657,786	08/19/1997	DuRoss et al.	
	23	US- 5,681,613	10/28/1997	Hansen	
	24	US- 5,709,753	01/20/1998	Olson et al.	
	25	US- 5,966,499	10/12/1999	Hinkle et al.	
	26	US- 6,066,209	05/23/2000	Sajoto et al.	
	27	US- 6,077,718	06/20/2000	Takasu et al.	
	28	US- 6,090,208	07/18/2000	Han	
	29	US- 6,258,171 B1	07/10/2001	Agarwal	
	30	US- 6,261,374 B1	07/17/2001	Bang et al.	
	31	US- 6,270,839 B1	08/07/2001	Onoe et al.	
	32	US- 6,354,241 B1	03/12/2002	Tanaka et al.	
	33	US- 6,409,839 B1	06/25/2002	Sun et al.	
	34	US- 2001/0042523 A1	11/22/2001	Kesala	
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

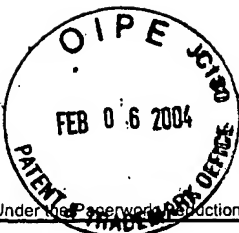
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				

Examiner
SignatureDate
Considered

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Sheet 3 of 3

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	35	Cross section drawing of AlCl ₃ precursor supply system, Lohja Corporation, 2 pages (unpublished).	

Examiner Signature		Date Considered	
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¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

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